

PUB-NO: WO002071515A1  
DOCUMENT-IDENTIFIER: WO 2071515 A1  
TITLE: GRAPHITE MATERIAL FOR NEGATIVE POLE OF  
LITHIUM SECONDARY BATTERY, METHOD OF MANUFACTURING THE  
GRAPHITE MATERIAL, AND LITHIUM SECONDARY BATTERY  
PUBN-DATE: September 12, 2002

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ASSIGNEE-INFORMATION:

NAME	COUNTRY
NIPPON STEEL CHEMICAL CO	JP
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APPL-NO: JP00201861

APPL-DATE: February 28, 2002

PRIORITY-DATA: JP2001062351A ( March 6, 2001)

INT-CL (IPC): H01M004/58, H01M004/02 , H01M010/40 ,  
C01B031/04

ABSTRACT:

CHG DATE=20021002 STATUS=O>A graphite material for negative pole of lithium secondary battery provided by adding, for graphitization, one or more types of boron or boron compound to the coke obtained by carbonizing coke material after pulverization and performing size control, characterized in that a tap density at the time of 20 times tapping is  $0.95 \text{ g/cm}^3$  or more and that at the time of 300 times tapping is  $1.15 \text{ g/cm}^3$  or more, and BET specific surface is  $1.15 \text{ m}^2/\text{g}$  or less; the lithium secondary battery using the graphite material for negative pole is large in discharge capacity and small in capacity loss at the time of charging and discharging.

PAT-NO: JP02002047006A  
DOCUMENT-IDENTIFIER: JP 2002047006 A  
TITLE: BULK MESOPHASE GRAPHITE AND ITS  
MANUFACTURING METHOD  
PUBN-DATE: February 12, 2002

INVENTOR-INFORMATION:

NAME	COUNTRY
NAGAYAMA, KATSUHIRO	N/A
EGUCHI, KUNIHICO	N/A
SUZUKI, TOSHIHIDE	N/A
SATO, NORIO	N/A
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ASSIGNEE-INFORMATION:

NAME	COUNTRY
KAWASAKI STEEL CORP	N/A

APPL-NO: JP2000232828

APPL-DATE: August 1, 2000

INT-CL (IPC): C01B031/04, H01M004/58 , H01M010/40

ABSTRACT:

PROBLEM TO BE SOLVED: To provide bulk mesophase graphite powder suitable for carbon material for an anode of a lithium ion secondary battery, its manufacturing method and the lithium ion secondary battery using it.

SOLUTION: In the bulk mesophase graphite, density of graphite grain is 2.24 g/cm<sup>3</sup> or more, layer distance d<sub>002</sub> is 0.3360 nm or less, tap density is 1.2

PAT-NO: JP02001213615A  
DOCUMENT-IDENTIFIER: JP 2001213615 A  
TITLE: CONSOLIDATED GRAPHITE PARTICLES,  
PRODUCTION PROCESS THEREOF AND ANODE MATERIAL FOR LITHIUM  
SECONDARY BATTERY  
PUBN-DATE: August 7, 2001

INVENTOR-INFORMATION:

NAME	COUNTRY
FUKUDA, KENJI	N/A
YASUMOTO, YOSHINORI	N/A
TSUNAWAKE, TADANORI	N/A
MITSUISHI, KATSUYA	N/A
HARA, YOICHIRO	N/A
UMENO, TATSUO	N/A
HIRUTA, TAKASHI	N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
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APPL-NO: JP2000021380

APPL-DATE: January 31, 2000

INT-CL (IPC): C01B031/04, H01M004/58 , H01M010/40

ABSTRACT:

PROBLEM TO BE SOLVED: To provide consolidated graphite particles and their production process in which graphite concentration in the graphite slurry can be enhanced at the molding of an article using graphite particles, and after molding, an article having high graphite density with high

isotropy can be obtained; and to provide a lithium secondary battery having an anode with high graphite density and high energy density per unit volume of the anode.

SOLUTION: The consolidated graphite particles used contain spindle-type or disc-type graphite particles where the content of the spindle-type graphite particles having aspect ration of 1 to 5 is 10% by volume or more, or the content of the disc-type graphite particles having aspect ratio of 1 to 10 is 50% by volume or more, and having tap density of 0.7 to 1.3 g/cm<sup>3</sup>.

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PUB-NO: EP000917228A1

DOCUMENT-IDENTIFIER: EP 917228 A1

TITLE: NONAQUEOUS ELECTROLYTE SECONDARY  
BATTERY

PUBN-DATE: May 19, 1999

INVENTOR-INFORMATION:

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ASSIGNEE-INFORMATION:

NAME	COUNTRY
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MITSUBISHI CHEM CORP	JP

APPL-NO: EP98921899

APPL-DATE: May 29, 1998

PRIORITY-DATA: JP14192097A ( May 30, 1997)

INT-CL (IPC): H01M010/40, H01M004/58 , H01M004/02

EUR-CL (EPC): H01M004/58

ABSTRACT:

CHG DATE=19990702 STATUS=O> Enhancement of the storage property at a high temperature and discharge characteristics at a low temperature of a nonaqueous electrolyte secondary cell is intended. A negative electrode material which is

prepared by covering the surface of a nucleus made of a graphite powder with a carbonaceous matter, the graphite powder having a specified plane interval, spectrum value, mean particle size, specific surface area, tapping density, and (110)/(004) X-ray peak intensity ratio, is used in the nonaqueous electrolyte secondary cell. <IMAGE>